

# Glossary

The terms listed below are part of the jargon of the metals analyst. They have been used freely in this book, in some cases without definition. As an aid to understanding, definitions are provided here. Some are close to standard English usage; others are from the *patois* of the working analyst.

**absorption**, n. 1. the incorporation of one substance with another. 2. the assimilation of energy (as, e.g., electromagnetic radiation).

**acid anhydride**, n. the compound that results from the removal of H<sub>2</sub>O from an acid. (Thus, SO<sub>3</sub> is the anhydride of H<sub>2</sub>SO<sub>4</sub>.)

**adsorption**, n. a chemical or physical process in which one substance adheres to the surface of another.

**aliquant**, n (archaic). an irrational fraction of the test solution (e.g., 3 mL out of 100 mL).

**aliquot**, n. a quantitative portion of the test solution (originally reserved for a rational fraction of the whole).

**amphoteric**, adj. having both acidic and basic properties, as e.g., the aqueous Al<sup>3+</sup> ion. (Also known as *amphiprotic*.)

**analyte**, n. the sample component that is quantified.

**azeotrope**, n. a constant boiling mixture of two or more liquids.

**bandpass**, n. the range of electromagnetic wavelengths that can pass a barrier, as, e.g., an optical slit.

**BEC**, abbrev. for Background Equivalent Concentration, a term often used in plasma optical emission spectrometry to denote apparent analyte concentration due to the sum of background and interferences.

**carrier**, n. 1. an element intentionally added to a solution to serve as a coprecipitant. 2. in chromatography, the gas or liquid that serves to transport the sample through the column and detector.

**chemisorption**, n. the absorption of one substance by another involving the formation of chemical bonds.

**chromophore**, n. a reagent that forms a colored compound or complex with the analyte.

**Coanda effect**, n. the property of a fluid in motion that causes it to adhere to a surface.

**coordination number**, n. the number of ligand-forming sites available on a molecule.

**coprecipitant**, n. an element or species that forms an insoluble compound at the same time and in the same manner as the analyte, serving as an aid to complete analyte precipitation.

**critical temperature**, n. the maximum temperature at which a gas can be liquified by the application of pressure.

**decant**, v.t. to pour off a top liquid layer, leaving a solid phase beneath undisturbed.

**deliquescent**, adj. having the property of certain salts that spontaneously absorb and partially dissolve in atmospheric moisture.

**dry filter**, v.t. to filter a solution beginning with a dry funnel, filter paper, and collection vessel.

**earth acids**, n. 1. a loosely used term that refers to certain elements of Groups IV, V, and VI. 2. those elements that tend to precipitate as hydrous oxides in dilute acid solution—commonly, niobium, tantalum, titanium, and tungsten; sometimes also, molybdenum, zirconium, hafnium, and tin.

**effluent**, n. that which flows out, as, e.g., a gas chromatographic peak or a column chromatographic eluate.

**effluence**, n. salt deposits that remain after liquid evaporation.

**eluate**, n. the effluent from a chromatographic column that contains a species of interest.

**eluent**, n. a liquid used to desorb one or more species from a solid phase chromatographic column.

**endothermic**, adj. taking up heat, as certain chemical reactions.

**eutectic**, n. a mixed salt or metal alloy composition that is the lowest melting combination of its components.

**exothermic**, adj. giving off heat, as certain chemical reactions.

**external indicator**, n. in titration, an endpoint indicator used with a drop of solution removed from the titration vessel (e.g., on a spot plate). This approach is now rarely used.

**flashback**, n. an accidental explosion of a flame atomic absorption burner.

**formal**, adj. (abbreviation: F), 1. expressed in concentration units of apparent equivalents per liter (archaic). 2. expressed in half-cell potential units of experimentally measured voltage.

**fume**, v.t. to heat a solution containing non-gaseous mineral acids to evolve the acid anhydride vapor.

**gangue**, n. a low value or worthless rock phase accompanying an ore.

**hydration**, n. the incorporation of water molecules in a chemical species.

**hydrolysis**, n. 1. any reaction involving water. 2. reaction with water to form an insoluble hydrous oxide precipitate.

**hydrophilic**, adj. (Lat.: "water-loving") having the property of a substance or chemical group that dissolves in or is wetted by water.

**hydrophobic**, adj. (Lat.: "water-fearing") having the property of a substance or chemical group that is immiscible in or is not wetted by water.

**hygroscopic**, adj. absorbing moisture from the atmospheric environment.

**IEC**, abbrev. for Inter-Element Correction, a term often used in spectrometry to denote an empirically derived constant used to compensate for spectral overlap.

**ignite**, v.t. to heat, usually at a high temperature.

**internal indicator**, n. in titration, a substance added to the test solution that changes color at the analyte endpoint.

**iodimetric**, adj. 1. referring to any redox titration involving direct or indirect oxidation with iodine. 2. (archaic) referring to those redox volumetric procedures involving direct titration with iodine solution.

**iodometric**, adj. (archaic) referring to those redox volumetric procedures involving indirect titration with iodine generated in situ in the sample solution (typically, by the reaction between iodate and iodide ion).

**laboratory sample**, n. the sample that is submitted to the laboratory.

**leach**, v.t. 1. to dissolve a cooled, solidified molten salt fusion in water or other reagents. 2. to remove an analyte selectively by treating a particulate solid test portion with acid or other solvent—a process of questionable rigor, which leaves some portion of the particles undissolved.

**lean**, adj. in flame atomic absorption, a fuel-depleted/oxidant-abundant gas mixture and the flame it produces.

**ligand**, n. the metal cations or other species that attach to certain molecules at specific sites to form coordination compounds.

**lot**, n. a recognized unit of production or shipment expected to have uniform properties.

**matrix**, n. the composite of sample components that are not being quantified, especially the major components (cf., **analyte**).

**meniscus**, n. the curved interface of a liquid column with the air above it. Buret and pipet readings are taken tangent to the curve.

**molar** (abbreviation: *M*), adj. expressed in concentration units of moles per liter or gram-atoms per liter.

**normal** (abbreviation: *N*), adj. expressed in concentration units of equivalents per liter.

**occlude**, v.t. to absorb and retain one substance in another, e.g., to coprecipitate.

**police**, v.t. to remove all traces of a precipitate from a vessel quantitatively, especially with the use of a rubber policeman.

**policeman**, n. a rubber paddle-like device that is attached to a rod for use in the quantitative removal and transfer of precipitates from a vessel.

**pyrophoric**, adj. tending to ignite spontaneously, especially by reaction with atmospheric oxygen.

**rich**, adj. in flame atomic absorption, a fuel-abundant/oxidant-depleted gas mixture and the flame it produces.

**sparge**, v.t. to bubble a gas through a liquid.

**stoichiometric**, adj. pertaining to chemical reactions in which reactants combine in predictable whole number proportions.

**tare**, v.t. to weigh an empty vessel so as to remove its value from a previous or subsequent weighing.

**tautomer**, n. an isomer of a compound that differs from it in the position of a double bond and a hydrogen atom. Such forms are in equilibrium with each other.

**test portion**, n. the unit of test sample used in a single analytical determination.

**test sample**, n. the sample, prepared from the laboratory sample, from which test portions are removed.

**titer**, n. in titration, an empirically derived factor for converting titrant volume to weight of analyte.

**triturate**, v.t. to grind to a fine powder, as with a mortar and pestle.